What is claimed is:

1. An imager module with a retractable lens comprising:

a lens holder having

an image end and an

object end and

an inner guide surface, parallel to

an optical axis,

an imager having

an image plane, the imager being coupled to the lens holder adjacent the lens holder image end and aligned to position the image plane to be normal to the optical axis,

a lens assembly having

an object end, and

an image end,

an external guide surface,

the lens assembly being coupled to the lens holder by the lens holder inner guide surface being coupled to the lens assembly external guide surface, the lens holder being formed to allow the lens assembly external guide surface to move on the lens holder inner guide surface from a retracted position to an extended position,

an objective lens with one or more lens elements concentrically aligned along and normal to the optical axis; and,

a means for extending the lens assembly and for holding the lens assembly in the extended position for an imaging interval during which the objective lens captures an object image, forms the object image on the image plane allowing the imager to capture and store the image in response to a command signal.

2. The imaging module of claim 1 wherein the lens assembly further comprises:

a lens barrel, having a cylindrical external surface shape, the lens barrel holding at least the objective lens first lens element centered on the optical axis to form the objective lens, the eternal guide surface being formed on a lens barrel external surface for engagement with the lens holder inner guide surface.

3. The imaging module of claim 1 wherein

the lens holder inner guide surface is formed having a forward surface portion and a rear surface portion, an object end aperture at the object end providing entrance to a first cylinder, the inner wall of the first cylinder forming the forward surface portion of the inner guide surface, the lens holder optical axis passing through the center of the first cylinder, the first cylinder having a first diameter, the first cylinder extending rearward to a first circular aperture bordered by a first shoulder surface, the first shoulder surface extending outward to a second cylinder having a diameter larger than the diameter of the first cylinder, the inner wall of the second cylinder forming the forward rear surface portion of the inner guide surface, the second cylinder extending to a second circular aperture bordered by a second shoulder surface, the second shoulder extending outward to a third cylinder having a diameter larger than the diameter of the second cylinder, the third cylinder extending rearward to a third circular aperture at the image end of the lens holder, the first, second and third cylinders being coaxial on the optical axis,

the lens assembly has a lens barrel, the lens barrel has an object end and an image end and a cylindrical surface, the cylindrical surface has a forward portion at the object end and a rear portion at the image end, the forward and rear portions form the external guide surface, the forward portion has a diameter formed to fit into the lens holder first cylinder, the rear portion forms a cylindrical flange and has a diameter formed to fit into the lens holder second cylinder and to telescopically slide within the second cylinder, the lens barrel forward portion is free to telescope out of the lens holder object end and to extend to a travel stop as the cylindrical flange contacting the lens holder first shoulder surface.

4. The imaging module of claim 3 wherein the lens barrel forward portion further comprises an outer barrel having an outer cylindrical surface that forms the lens assembly external guide surface, and an inner lens barrel within the outer barrel, the inner barrel is coupled to support and locate the one or more lens elements forming the objective lens, the outer barrel and the inner barrel are coupled together at a flexure formed between the outer barrel and the inner barrel, the flexure being characterized to hold a portion of the outer barrel outer surface in contact with the lens holder inner guide surface.

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5. The imaging module of claim 4 wherein the imaging module further comprises: a spring having an object end coupled to the lens barrel image end and an image end coupled to the lens holder, the spring is contained in the lens holder second cylinder, the spring expands to apply a force to the image end of the lens assembly flange driving the lens assembly to an extended state.

6. The imaging module of claim 4 wherein the flexible outer barrel outer cylindrical surface is further characterized to have a protrusion adjacent the flexible outer barrel, and the lens holder inner surface is further characterized to have a recess formed to receive the protrusion as the lens assembly is forced into a retracted state, the lens holder first and second cylinders receiving the lens assembly, the spring being compressed in the lens holder second cylinder as the lens assembly is moved into a retracted position.

7. The imaging module of claim 4 wherein the lens assembly outer barrel is magnetized have:
an object end magnetic pole having a first magnetic polarity and an image end magnetic pole having a second magnetic polarity, and wherein:
the lens holder has an external surface, the lens holder having a coil coupled to the lens holder external surface for forming an electromagnetic field in at least the lens

holder first or second cylinder in response to an electrical command signal, the polarity of the electromagnetic field and the polarity of the image end magnet pole and the object end magnetic pole being ordered to produce a force to move the lens assembly to a fully extended position.

8. The imaging module of claim 1 wherein the lens assembly barrel has an object end magnetized to form an object end magnet pole having a first magnetic polarity and an image end magnetic pole having a second magnetic polarity,

the lens holder having an external surface,

a coil means coupled to the lens holder external surface for forming an electromagnetic field in the lens holder first cylindrical aperture in response to an electrical signal, the polarity of the electromagnetic field and the polarity of the image end magnet and the object end magnet being ordered to produce a force to move the lens assembly to a fully extended position.

9. The imaging module of claim 1 wherein the means for extending the lens assembly and for holding the lens assembly in the extended position for an imaging interval further comprises:

a lens barrel outer surface having a permanent magnet coupled to its surface,

a non-fero-magnetic ring axially positioned on a circular lens holder outer surface and free to rotate, the ring having at least two permanent magnets to be coupled to the ring on opposing radials to permit the polarity of the magnetic pole applied to permit the magnet in the lens barrel to be reversed by rotation of the ring.

10. The imaging module of claim 1 wherein the means for advancing the lens assembly to the extended position in response to an extend signal is provided by a compressed spring having an object end pressing to the lens barrel image end and an image end coupled to the lens holder, the spring is contained in the lens holder second cylinder, the spring expanding to apply a force to the image end of the lens barrel flange to drive the lens assembly to an extended state, and wherein the means for retracting the lens assembly to a retracted position is a manually applied force to the lens barrel to drive the lens barrel into the lens holder first and second cylinders.

11. The imaging module of claim 1 wherein the means for advancing the lens assembly to the extended position in response to an extend signal and for retracting the lens assembly to a retracted position is a permanent magnet combination.

12 The imaging module of claim 1 wherein the means for extending the lens assembly and for holding the lens assembly in the extended position for an imaging interval during which the objective lens captures an object image, forms the object image on the image plane allowing the imager to capture and store the image in response to a command signal further comprises:

a coil on the lens holder coupled to a signal source to receive a pulse of current having a first polarity from the signal source, the current in the coil producing a magnetic field in the lens holder first and second cylinders, the lens assembly having

a lens barrel having a cylindrical external surface shape, the lens barrel having a permanent magnet formed therein, the permanent magnet being orientated to be repulsed by the magnetic field having a first polarity to drive the lens assembly to an extended position.

13 The imaging module of claim 1 wherein the means for advancing the lens assembly to the extended position in response to an extend signal and for retracting the lens assembly to a retracted position in response to a retract signal is an electromagnetic-magnetic means and further comprises:
a coil on the lens holder connected in series with a coil on the lens assembly (outer barrel) responsive to a signal source responsive to an extend signal and a retract signal for providing the direction of a pulse current through the coil on the lens holder and the lens assembly.

14 An imager module with a retractable lens comprising:
a lens holder having
an image end and an
object end and
an inner guide surface, parallel to
an optical axis,
an imager having
an image plane, the imager being coupled to the lens holder adjacent the lens holder image end and aligned to position the image plane to be normal to the optical axis,
a lens assembly having
an object end, and
an image end,
an external guide surface,
a lens barrel having an external guide surface,
the lens assembly being coupled to the lens holder by the lens holder inner guide surface being coupled to the lens assembly external guide surface, the lens holder being formed to allow the lens assembly external guide surface to move on the lens holder inner guide surface from a retracted position to an extended position,
an objective lens with one or more lens elements concentrically aligned along and normal to the optical axis; and,

a coil on the lens assembly and a coil on the lens holder outer surface. the coils being connected in series to provide a repulsive force to drive the lens barrel to an extended state in response to an extend signal and to a retracted state in response to a retract signal.

15. A handheld device having an extendable imager, the extendable imager comprising:

a lens holder having

an image end and

an object end and

an inner guide surface,

an imager having an image plane, the imager being coupled to the lens holder adjacent the lens holder image end,

a lens assembly having an objective lens with one or more lens elements and an optical axis, the lens assembly having

a lens barrel holding at least one lens,

an image end,

an object end,

an optical axis and

an external guide surface, the lens assembly external guide surface being supported by the lens holder inner guide surface, the lens holder being formed to allow the lens assembly external guide surface to move on the lens holder inner guide surface from a retracted position or latched position to an extended or unlatched position,

a means for advancing the lens assembly to the extended position in response to an extend signal.

16. The handheld device of claim 15 wherein the means for advancing the lens assembly to the extended position in response to an extend signal comprises:

a lens barrel having at least one permanent magnet embedded therein,

a ring positioned and formed to rotate on the lens holder, the ring having at least one magnet embedded therein, the magnet in the barrel and the magnet in the ring providing a field to drive the lens barrel into an extended mode in response to the ring being rotated to have the field of the magnet embedded in the ring repulse the field provided by the magnet in the lens barrel.